



https://blog.google/products/search/about-knowledge-graph-and-knowledge-panels/ images: screengrabs from: https://www.youtube.com/watch?v=mmQl6VGvX-c









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Sampling of cognitive biases from Dimara et al.'s list

▶ 17 of the 154 seem potentially applicable to ontologies; e.g.:

- Mere exposure/familiarity: choice is influenced by exposure to it and thus familiarity with it.
- Naive realism: the belief that you experience objects in your world objectively.
- False Consensus: Overestimating that other people are and behave like you and agree with your opinion.
- Barnum effect: High accuracy ratings for vague and general statements. (?)

Possible biases, by source

Summary of typical possible biases in ontologies grouped by source

Philosophical - explicit Purpose - explicit Science explicit Granularity either Linguistic either Socio-cultural either
Purpose - explicit Science explicit Granularity either Linguistic either either either
Subject domain
Political or religious Economics either explicit

Foundational ontology differences (philosophical or otherwise)

- ▶ Realism vs idealism, concepts, universals etc.
- Some differences don't matter in praxis; some do
- Ways to find and resolve the (explicit!) conflict(s)
- Example: BFO's realism does not accept abstract entities

Keet, C.M., Grütter, R. Toward a systematic conflict resolution framework for ontologies. Journal of Biomedical Semantics, 2021, 12:15.





- Pattern B: conceptual data modelling influence or purpose
- Pattern C: a thesaurus-like approach useful for document annotation

Fillottrani, P.R., Keet, C.M.. Dimensions Affecting Representation Styles in Ontologies. 1st Iberoamerican

nference on Knowledge Graphs and Semantic Web GSWC'19). Springer CCIS vol. 1029, 186-200. Continuant ClassC ClassC participant ClassB Pattern B ClassC hasB: anyType Pattern C ClassC BT Continuant RT ClassB







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COVID-19 ontologies

- 'same' topic on COVID-19, developed at same time by different groups
 - Coronavirus Infectious Disease Ontology (CIDO) [He20]
 - COviD-19 Ontology (CODO) [Dutta20]
 - Coronavirus Vocabulary (COVoc) [Pendlington20]
- Assess their documentation, characteristics, content
- Iteratively note observations of bias and check subset of cognitive bias list and consider wrt the ontologies

Bias by cognitive bias

Bias (Cognitive biases from Dimara et al's list)	CIDO	CODO	COVoc
Mere exposure/familiarity	+		+
(choice is influenced by exposure to it and thus familiarity with it)			
Negative interpretation	+		
(judgement is affected more by negative information than positive)			
Optimism	+		
(more positive predictions for oneself than for others)			
Naive realism	+		
(the belief that you experience objects in your world objectively)	- 22		
False Consensus		+	
(Overestimating that other people are and behave like you and agree		- 63	
with your opinion)			
Illusory truth effect			+
(a statement is considered to be true after repeated exposure to it)			8

Presence/absence, by source

Philosophical + - + Purpose - + + Science - - + Granularity ± + +
Purpose – + + Science – – + Granularity ± + +
Science – – + Granularity ± + +
Granularity ± + +
Linguistic
Linguistic
Socio-cultural + + +
Political or religious + + +
Economics – – ±

Bias (Se	ource/type)	CIDO	CODO	COVoc
Philosop	ohical	+		+
Purpose	1	-	+	+
Science		-	-	+
Granula	rity	±	+	+
Linguist	tic	+	1	2
Socio-cu	ultural	+	+	-
Political	l or religious	+	+	+
Econom	lee			+





Any effects on automated reasoning?

- 'Incoherence' (one or more unsatisfiable classes), inconsistencies, or undesirable deductions
- For TBox only: incoherence and undesirable deductions will be found at authoring time already, not during deployment
- For the knowledge base (Tbox + Abox [in owl or secondary storage]): inconsistencies or undesirable deductions either at authoring time or during deployment
 - Querying data
 - Annotating data (and subsequent retrieval)





























